SIGNIFICANT WATER-RESOURCES STUDIES

A variety of significant water-resources studies have been completed in selected areas of the Mexican Highlands subarea. In addition, a series of biological, ecological, and hydrological studies are currently underway along the banks of the San Pedro River within the first Congressionally designated Riparian National Conservation Area. This area was declared one of the "12 Great Places of the Western Hemisphere" by the Nature Conservancy.

The principal aquifers in the subarea (fig. 6) are in the basins and are composed of unconsolidated to semiconsolidated, basin-fill deposits, as much as several thousand feet thick. The basins generally are connected in a dendritic pattern, similar to the surface drainage, to form an integrated regional flow system (Anderson and others, 1992). The rocks of the mountains surrounding the basins yield little or no water. The delineations and extent of basin-fill aquifers in Mexico were digitized from 1: 250,000-scale Hydrologic Maps of Ground Water produced by the Direccion General de Geografia del Territorio Nacional (1981).

Significant ground-water studies in the subarea initially focused on the Tucson Basin because it was subject to the greatest population and development growth. Anderson (1972) constructed an electrical-analog model of the hydrologic system in the Tucson Basin; model projections indicated a maximum water-level decline of 140 feet by 1985. Davidson (1973) described and quantified the geohydrology and water resources of the Tucson Basin. As part of the U.S. Geological Survey's Regional Aquifer-System Analysis program, the geohydrology and water resources of alluvial basins in the U.S. part of the subarea were investigated (Anderson and others, 1992). In addition, Freethey and Anderson (1986) produced a series of maps for each alluvial basin in the U.S. part of the subarea that shows ground-water budgets, predevelopment water-table contours, and direction and relative volume of ground-water underflow. Robson and Banta (1995) provided a regional overview of ground-water resources in the alluvial basins in the subarea. In addition, the National Park Service has completed an assessment of water-resource management concerns at Saguaro National Park near Tucson (Mott, 1997).

As shown on figure 6, 19 discharge stations, 3 crest-stage partial-record stations, and 2 water-quality stations are currently (1996) in operation. Data also have been compiled for 50 discontinued discharge stations, 19 discontinued crest-stage partial-record stations, and 5 discontinued water-quality stations in the U.S. part of the subarea; 3 discharge stations are known in the Mexican part of the subarea. Almost half (60 of 124) of the stations ever operated in the subarea are located in basins whose streams pass through the Tucson area. Condes de la Torre (1970) characterized streamflow in the upper Santa Cruz River Basin, and Burkham (1970) used long-term streamflow data for 16 of the discharge stations to estimate the streamflow depletion by infiltration in the main channels of the Tucson Basin.

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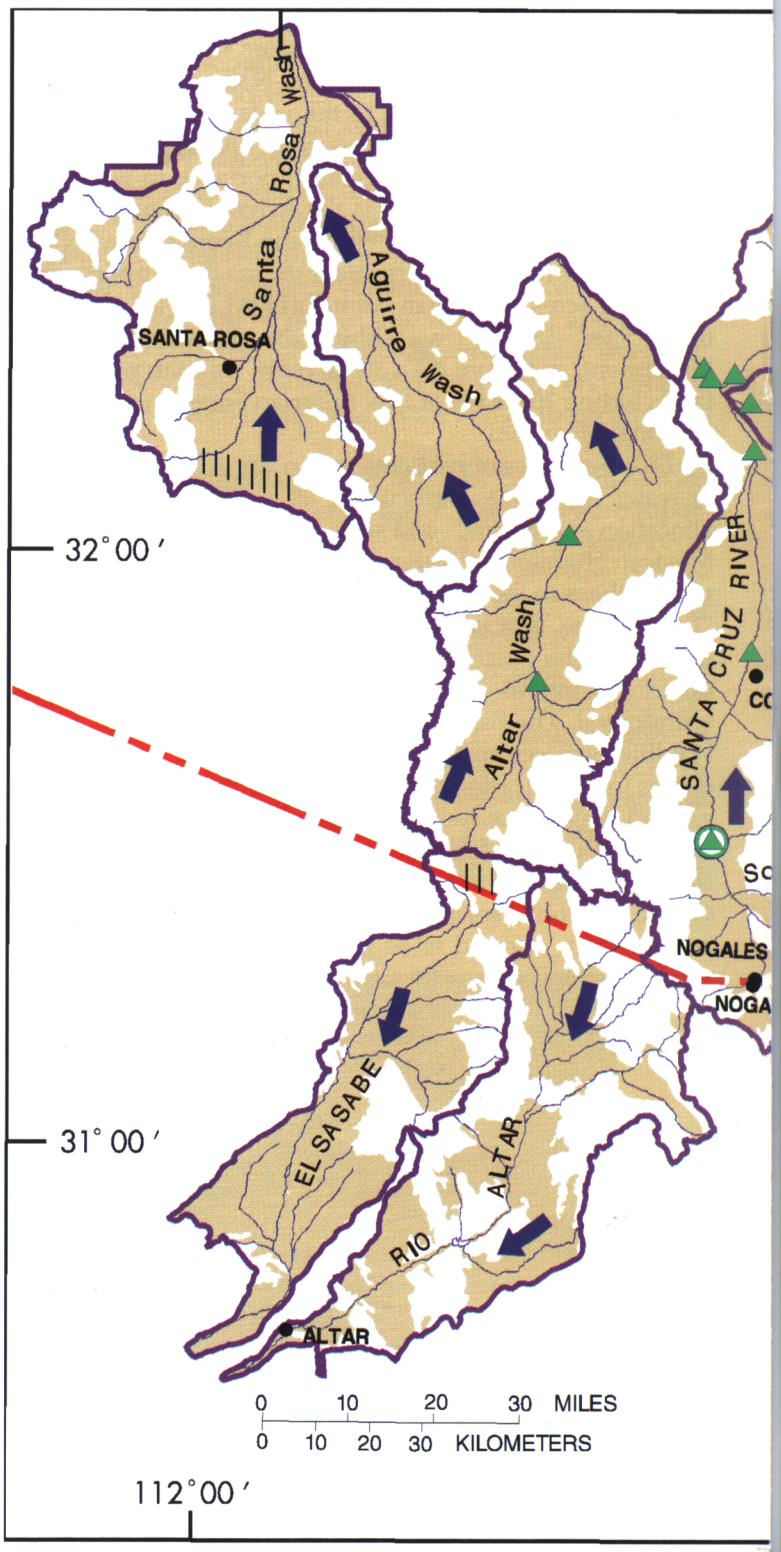

Figure 6. Generalized hydrologic inform